Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V (PROPOSED PERMIT) NO. V-03-018
KINGSFORD MANUFACTURING COMPANY
BURNSIDE, KY
JANUARY 9, 2004
DANNY BALLARD/RALPH E. GOSNEY, REVIEWER
PLANT I.D. # 21-199-00018
APPLICATION LOG # F937/50732

SOURCE DESCRIPTION:

A Title V Permit Application for the Kingsford Manufacturing Company (Kingsford) was received on October 2, 1996 for the existing facility, which manufactures charcoal briquets with various additives. An air quality permit to construct and operate a Solvent Treated Briquet (STB) production line was issued on June 9, 1998, subject to Prevention of Significant Deterioration (PSD) regulations. An amendment to the Title V Permit Application was received on May 3, 1999 for the addition of a new lighter fluid bottling line.

The facility is classified as a major source of air pollution based on the potential to emit more than 100 tons per year (tpy) of particulate matter (PM) and nitrogen oxides (NO_x). New Source Performance Standards (NSPS) applies to the 300-hp waste heat boiler installed in 1991. Four units also went through Prevention of Significant Deterioration (PSD) review with the addition of the STB production line, approved on May 3, 1999.

The following is a list of significant emission units.

E. Unit 01 Wood receipt and storage

E. Unit 02 Wet Wood Dryer and Dry Wood Charring Furnace (Retort Furnace) – both controlled by After Combustion Chamber (ACC) with ACC stack

E. Unit 03 Briquet Cooler B

E. Unit 04 Briquet Cooler C

E. Unit 05 Briquet Manufacturing Dust Collection (pre-packaging)

E. Unit 06 Briquet Packaging and Bagging Dust Collection

E. Unit 07 Briquet Dryer A

E. Unit 08 Briquet Dryer B

E. Unit 09 Briquet Dryer C

E. Unit 10 #2 oil fired indirect heat exchanger rated at 12.6 mmBtu/hr (Waste Heat Boiler)

List of Significant Emission Units Continued

E. Unit 11 Plant roads

E. Unit 37 Solvent Treated Briquet (STB) production line

Sect. D Facility STB fines fugitive emissions

COMMENTS:

E. Unit 01: Wood receipt and storage

The wood is wet prior to entering the dryer. For emission reporting and fee assessment, an emission factor of 0.10 lb PM/ton dry wood and 0.0473 lb PM_{10}/ton dry wood was used by Kingsford based on engineering judgement. Based on AP-42 emission factors for similar wood handling operations and another wood handling facility in Kentucky, the emission factor used by Kingsford is a conservative number. Monitoring and record keeping of the throughput rate of dry wood shall be maintained on a monthly basis to estimate emissions from this unit. The production rate limit is currently 280,320 tons of dry wood/year. The rate of wet wood processed is monitored continuously at the facility. The rate of dry wood processed is calculated from the rate of wet wood by the conversion dry wood equals 50% of wet wood, based on literature and past testing of materials used at the plant. This conversion was also used for all stack testing and calculations to determine emission factors.

Regulation 401 KAR 63:010 applies to the operating (prevention of particulate matter from becoming airborne) and emission limitations (no visible fugitive dust emissions beyond the property line) for this unit. Compliance is by good operating procedures (wood is wet).

E. Unit 02 Wet Wood Dryer and Dry Wood Charring Furnace (Retort Furnace) – both controlled by After Combustion Chamber (ACC) with ACC stack

The wet wood dryer is a post 7/2/75 unit, subject to 401 KAR 59:010 regulations for new process operations. The retort furnace is pre 7/2/75, subject to 401 KAR 61:020 regulations for existing process operations. Emissions from the retort furnace and wood dryer go through cyclone separators. The gases from the cyclone exhausts are combined in the ACC. The maximum rate for wet wood is 64 tons/hr. The maximum rate for dry wood is 32 tons/hr. The combined allowable emissions for PM is

$$\text{Combined Allowable Rate of Emission in lb of PM/hr} = 17.31(P_1)^{0.16} + 55(P_2)^{0.11} - 40$$
$$\text{Maximum} = 73.6 \text{ lb PM/hr}$$

where the max $P_1 = 64 - (0.1)(64) = 57.6$, assuming 10% uncombined moisture in wet wood and the max $P_2 = 32$, from the combined emissions in the ACC unit.

Stack testing was performed in March 1995 using EPA Reference test methods to determine emission rates of all criteria pollutants from the ACC stack. Maximum emission from the ACC stack was 69 lbs PM/hr at 100% flow through the stack.

For compliance with the PM emission limit, an emission factor of 2.16 lbs PM/ton of dry wood shall be used, based on the 1995 stack test, until new information is gathered from the ACC stack test that shall be performed within 6 months from issue of the final permit.

For emission reporting and fee purposes, the following emission factors shall be used from the 1995 stack test data, until the new stack test is performed: 1.73 lb PM_{10}/ton dry wood; 1.72 lb NO_x/ton dry wood; 0.088 lb CO/ton dry wood; 0.081 lb SO_2/ton dry wood; and 0.26 lb VOC/ton dry wood.

E. Unit 03 Briquet Cooler B

The maximum production rate for Cooler B is 7 tons of briquets/hr. The unit is subject to a production PM emission limitation, 401 KAR 61:020:

$$E = 4.10(7)^{0.67} = 15.10 \text{ lbs PM/hr}$$

Stack testing was performed in March 1995 using EPA Reference test methods to determine emission rates of for PM and PM_{10} from the two stacks of the unit. Maximum emissions from the unit were 3.35 lbs PM/hr and 0.96 lbs PM_{10}/hr.

For compliance with the PM emission limit, an emission factor of 0.48 lbs PM/ton of briquets shall be used, based on the 1995 stack test, until new information is gathered from the unit stack tests that shall be performed within 6 months from issue of the final permit.

For emission reporting and fee purposes, the following emission factors shall be used from the 1995 stack test data, until the new stack tests are performed for this unit: 0.14 lb PM_{10}/ton briquets.

E. Unit 04 Briquet Cooler C

The maximum production rate for Cooler C is 8 tons of briquets/hr. The unit is subject to a production PM emission limitation, 401 KAR 59:010:

$$E = 3.59(8)^{0.62} = 13.03 \text{ lbs PM/hr}$$

Stack testing was performed in March 1995 using EPA Reference test methods to determine emission rates of for PM and PM_{10} from the two stacks of the unit. Maximum emissions from the unit were 3.97 lbs PM/hr and 1.94 lbs PM_{10}/hr.

For compliance with the PM emission limit, an emission factor of 0.50 lbs PM/ton of briquets shall be used, based on the 1995 stack test, until new information is gathered from the unit stack tests that shall be performed within 6 months from issue of the final permit.

For emission reporting and fee purposes, the following emission factors shall be used from the 1995 stack test data, until the new stack tests are performed for this unit: 0.24 lb PM_{10}/ton briquets.

E. Unit 05 Briquet Manufacturing Dust Collection (pre-packaging) and
E. Unit 06 Briquet Packaging and Bagging Dust Collection

A separate baghouse is the control device for the briquet manufacturing area and the briquet packaging and bagging area, each with a 98% rated efficiency. Emission factors were calculated based on the maximum rated volumetric flowrate for each collector and the maximum outlet PM concentrations (gr/scf) from vendor control device estimates.

The manufacturing dust collectors will be limited by a briquet manufacturing limit of 23.2 tons of briquets/hr, based on the maximum throughput of the briquet dryers. This unit is subject to a production PM emission limitation, 401 KAR 59:010:

$$E_{\text{briquet manufacturing dust collector}} = 3.59(23.2)^{0.62} = 25.22 \text{ lbs PM/hr}$$

For compliance with the PM emission limit, an emission factor of 0.20 lbs PM/ton and PM10/ton of briquets shall be used.

The briquet packaging and handling dust collectors will be limited by a briquet packaging limit of 30 tons of briquets/hr, based on the maximum throughput of packaging equipment. This unit is also subject to a production PM emission limitation, 401 KAR 59:010:

$$E_{\text{briquet packaging and handling dust collector}} = 3.59(30)^{0.62} = 29.57 \text{ lbs PM/hr}$$

For compliance with the PM emission limit, an emission factor of 0.18 lbs PM/ton and PM10/ton of briquets shall be used.

E. Unit 07 Briquet Dryer A

Briquet Dryer A is a pre 7/2/75 unit, subject to 401 KAR 61:020. The dryer has also been permitted under the June 9, 1998 Prevention of Significant Deterioration (PSD) air permit, subject to 401 KAR 51:017. The maximum rate for charcoal briquets through the dryer is 5 tons/hr. The allowable emissions for PM is

$$E_{\text{dryer A}} = 4.10(5)^{0.67} = 12.05 \text{ lbs PM/hr}$$

Stack testing was performed in March 1995 using EPA Reference test methods to determine emission rates of PM from both stacks of the unit. For compliance with the PM emission limit, an emission factor of 0.45 lbs PM/ton of briquets shall be used, based on the 1995 stack test, until new information is gathered from the unit stack tests that shall be performed within 6 months from issue of the final permit.

For emission reporting and fee purposes, the following emission factors shall be used from the 1995 stack test data for PM from this unit and all criteria pollutants from the 1995 ACC stack test, until the new stack tests are performed: 0.33 lb PM_{10}/ton briquets; 0.40 lb NO_x/ton briquets; 0.056 lb CO/ton briquets; 0.78 lb SO_2/ton briquets; and 0.060 lb VOC/ton briquet.

For emission limits and compliance with PSD, please refer to Sect. D, Facility STB fines fugitive emissions.

E. Unit 08 Briquet Dryer B

Briquet Dryer B is a pre 7/2/75 unit, subject to 401 KAR 61:020. The dryer has also been permitted under the June 9, 1998 PSD air permit, subject to 401 KAR 51:017. The maximum rate for charcoal briquets through the dryer is 7 tons/hr. The allowable emissions for PM is

$$E_{dryer\ B} = 4.10(7)^{0.67} = 15.10 \text{ lbs PM/hr}$$

Stack testing was performed in March 1995 using EPA Reference test methods to determine emission rates of PM from both stacks of the unit. For compliance with the PM emission limit, an emission factor of 0.64 lbs PM/ton of briquets shall be used, based on the 1995 stack test, until new information is gathered from the unit stack tests that shall be performed within 6 months from issue of the final permit.

For emission reporting and fee purposes, the following emission factors shall be used from the 1995 stack test data for PM from this unit and all criteria pollutants from the 1995 ACC stack test, until the new stack tests are performed: 0.30 lb PM_{10}/ton briquets; 0.49 lb NO_x/ton briquets; 0.069 lb CO/ton briquets; 0.97 lb SO_2/ton briquets; and 0.074 lb VOC/ton briquet.

For emission limits and compliance with PSD, please refer to Sect. D, Facility STB fines fugitive emissions.

E. Unit 09 Briquet Dryer C

Briquet Dryer C is a post 7/2/75 unit, subject to 401 KAR 59:010. The dryer has also been permitted under the June 9, 1998 PSD air permit, subject to 401 KAR 51:017. The maximum rate for charcoal briquets through the dryer is 8 tons/hr. The allowable emissions for PM is

$$E_{dryer\ C} = 3.59(8)^{0.62} = 13.03 \text{ lbs PM/hr}$$

Stack testing was performed in March 1995 using EPA Reference test methods to determine emission rates of PM from both stacks of the unit. For compliance with the PM emission limit, an emission factor of 0.40 lbs PM/ton of briquets shall be used, based on the 1995 stack test, until new information is gathered from the unit stack tests that shall be performed within 6 months from issue of the final permit.

For emission reporting and fee purposes, the following emission factors shall be used from the 1995 stack test data for PM from this unit and all criteria pollutants from the 1995 ACC stack test, until the new stack tests are performed: 0.21 lb PM_{10}/ton briquets; 0.45 lb NO_x/ton briquets; 0.063 lb CO/ton briquets; 0.89 lb SO_2/ton briquets; and 0.068 lb VOC/ton briquet.

For emission limits and compliance with PSD, please refer to Sect. D, Facility STB fines fugitive emissions.

E. Unit 10 #2 oil fired indirect heat exchanger rated at 12.6 mmBtu/hr (Waste Heat Boiler)

The waste heat boiler produces steam for various process operations. The waste heat boiler influent is from a percentage of the ACC exhaust gases. The exhaust from the waste heat boiler goes through the waste heat boiler stack and operates from one of two methods:

1. Waste heat from the ACC stack exhaust with no oil firing in the waste heat boiler; or
2. Waste heat from the ACC stack exhaust with firing distillate fuel oil (0.5% sulfur in oil) in a single 12.6 mmBtu/hr burner in the waste heat boiler.

The applicable regulations and emission limitations are dependent on the method of operation.

1. Waste heat from percentage of the ACC stack exhaust (no oil firing)

Testing was performed in 1995 to determine the measured flowrate of gases through the ACC and the waste heat boiler stack. Based on this testing, a maximum of 5.5 percent of the ACC flow goes to the waste heat boiler. Based on this maximum flowrate and the ACC stack testing for all criteria pollutants, the following emission factors shall be used for emission reporting and fee purposes, until a new ACC stack test is performed: 0.12 lb PM/ton dry wood; 0.095 lb PM_{10}/ton dry wood; 0.094 lb NO_x/ton dry wood; 0.0048 lb CO/ton dry wood; 0.0045 lb SO_2/ton dry wood; and 0.014 lb VOC/ton dry wood. The maximum rate for dry wood is 32 tons/hr.

2. Waste heat from percentage of the ACC stack exhaust (distillate oil firing, 0.5 %S)

Regulation 40 CFR 60, subpart Dc, limits the percent of sulfur in the fuel to 0.5 weight percent sulfur. Compliance with this limitation will be obtained from the use of low sulfur fuel and monitoring and recordkeeping of the fuel used in the heat exchanger.

Regulation 401 KAR 59:015 applies to new indirect heat exchangers:

$$E = 0.9634(12.6)^{-0.2356} = 0.53 \text{ lbs PM/mmBtu}$$
$$E = 7.7223(12.6)^{-0.4106} = 2.73 \text{ lbs } SO_2\text{/mmBtu}$$

For compliance with the PM and SO_2 emission limit, an emission factor of 0.014 lbs PM/mmBtu and (1.07)(% Sulfur) lbs SO_2/mmBtu shall be used, based on AP-42 emission factors, and the heat capacity of the heat exchanger.

The following emission factors shall be used to determine the emissions from fuel consumption in the unit, based on AP-42 emission factors: 0.007 lb PM_{10}/mmBtu; 0.143 lb NO_x/mmBtu; 0.036 lb CO/mmBtu; and 0.002 lb VOC/mmBtu. Note that these emission factors do not include the emissions already going through the waste heat boiler from the ACC exhaust.

E. Unit 11 Plant roads

Regulation 401 KAR 63:010 for fugitive emissions will apply to plant roads. No person shall cause, suffer, or allow any material to be handled, processed, transported, or stored without taking reasonable precaution to prevent particulate matter from becoming airborne. No person shall cause or permit the discharge of visible fugitive dust emissions beyond the lot line of the property on which the emissions originate.

For emission reporting and fee purposes, refer to the attached spreadsheet on paved roads and unpaved roads. The emission factors are based on AP-42 emission factors for paved and unpaved roads. Road silt loading and silt content of unpaved roads was calculated from site testing. Site data was also used to estimate the vehicle mile traveled for each road with an estimated 30 tons in each truck. There was an average of 120 days per year greater than 0.01 inches of rainfall. The speed limit for all facility roads is 10 miles per hour.

For compliance, the facility shall maintain records of the calculations to determine the fugitive emissions from paved and unpaved roads with all data used in the calculations. Records shall be maintained for the current year and the two previous years. Compliance with the fugitive emission limitation may include the washing of paved roadways and washing of vehicles and vehicular tires before exiting the facility, if necessary. The facility has posted a 10 miles per hour sign on facility property.

E. Unit 37 Solvent Treated Briquet (STB) production line

The STB production line has been permitted under the June 9, 1998 PSD air permit, and is subject to 401 KAR 51:017. Pursuant to this regulation, there are numerous operating and emission limitations to control and minimize VOC emissions. All limitations and requirements from the 1998 PSD permit will be rolled over into this Title V permit. No significant changes have been made to the STB production line since the 1998 PSD permit.

The facility shall use an emission factor of 64.7988 pounds of VOC per 1,000 gallons of lighter fluid with a 95% efficiency of the ACC unit for removal of VOC emissions, until new information is gathered from the ACC stack test that shall be performed within 6 months from issue of this permit. The stack test shall determine the VOC emissions from the ACC unit due to the solvent treated briquet line operation. Compliance will be obtained from the following monitoring and record keeping: the usage rate of lighter fluid in any consecutive twelve month period; the STB production rate in any consecutive twelve month period; and the average lighter fluid usage on a weekly basis to insure permit limitations are not exceeded.

Sect. D Facility STB fines fugitive emissions

The STB production line and dryers A, B, and C have been permitted under the June 9, 1998 PSD air permit, and were subject to 401 KAR 51:017. Fines from the STB production process contain VOCs, and the fines are recycled though one of the three dryers. Pursuant to this regulation, VOC emissions from the three dryers (E.U.'s 07, 08, and 09) shall not exceed 51.9 lbs/hour averaged on a daily basis and 169.3 tons in any consecutive twelve months period.

For emission reporting and fee purposes, the overall STB fines VOC emission factor is 2.23 pounds of VOC per ton of STB produced (including both the rerun fines and the tank recycle fines). The VOC emission factors provided by Kingsford are stated to be the most accurate emission estimates available (referenced from the May 2, 2003 Kingsford letter).

Compliance is demonstrated with the solvent usage rate limitation on E.U. 37. All limitations and requirements from the 1998 PSD permit will be rolled over into this Title V permit. No significant changes have been made to the STB production line since the 1998 PSD permit.

Regulations not applicable:

Regulation 40 CFR, part 64 – Compliance Assurance Monitoring, does not apply due to the applicability date. The Title V permit application was filed on October 7, 1996. The application was noted as deficient on November 20, 1996. Responses to deficiencies were received on February 5, 1997, and noted as acceptable in a letter from the Division on April 10, 1997. No letter was sent by the Division within 60 days after the receiving the information noting deficiencies, the permit was deemed complete by default (before April 20, 1998 for CAM). A formal letter acknowledging completeness of the application was sent on February 1, 1999.

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